RECOVERING ELEMENTS

Phosphorous from wastewater*J. Environ. Manage.* **238**, 41–48 (2019)

Credit: David Orr / Getty

Phosphorous is a major component of fertilizers to increase crop yields, but it is a non-renewable resource mostly obtained by mining. Municipal wastewater is a potential source, but its use has been prevented because the phosphorous concentration is too low for the recovery to be economically viable. Phosphate-accumulating microorganisms can be used to increase the concentration through a process called simultaneous nitrification–denitrification and phosphorous removal (SNDPR). This process removes the carbon, nitrogen and phosphorous from wastewater, but the method requires the addition of an extra carbon source to recover the phosphorous.

Sara Salehi and colleagues from CSIRO, Curtin University, and Murdoch University in Western Australia have used a sequencing batch reactor SNDPR process to recover a highly concentrated phosphorous liquor. They used waste sludge from a local municipal wastewater treatment plant and alternated the reactor between aerobic and anoxic conditions to grow the microorganisms on synthetic wastewater containing ammonia, carbon and phosphorous levels typically found in municipal wastewater. Using this process, they were able to concentrate the phosphorous to up to 100mg per litre. This process uses carbon levels typically found in wastewater, so it is a promising step towards recovering phosphorous while treating wastewater.

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